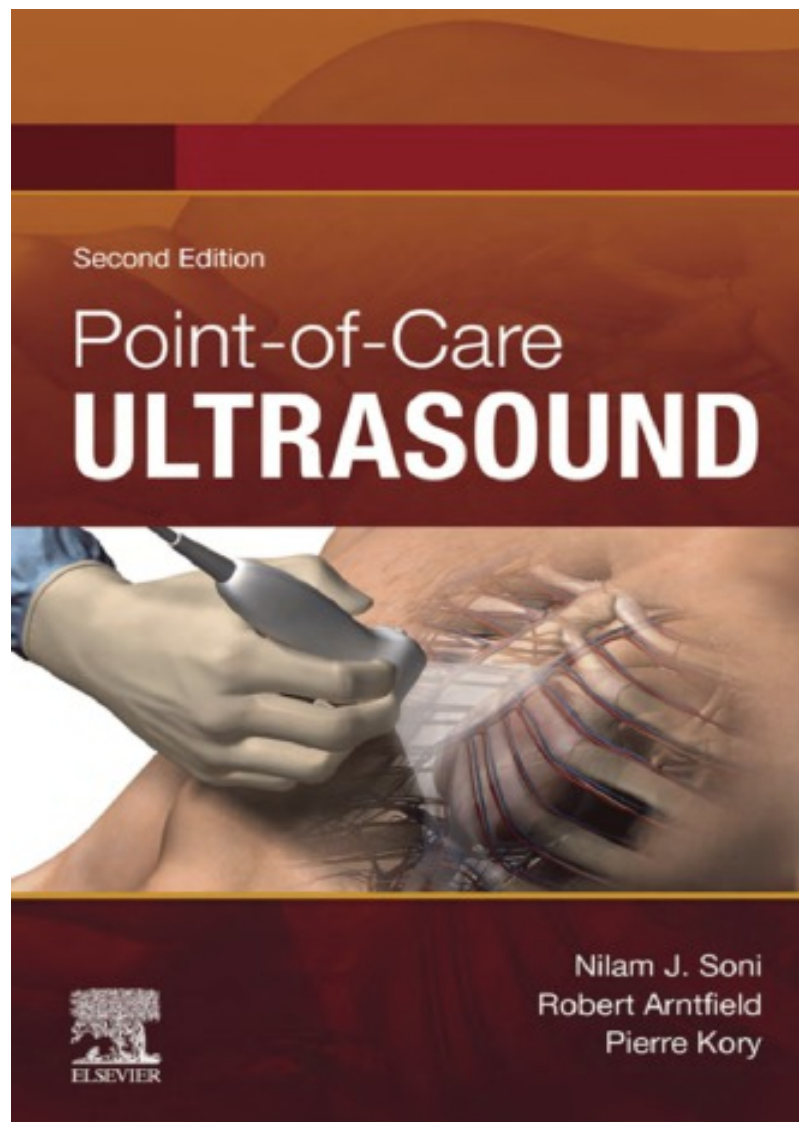


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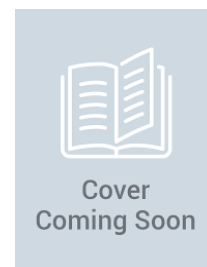


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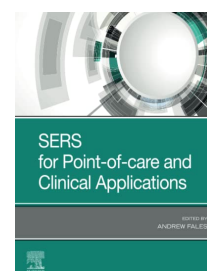
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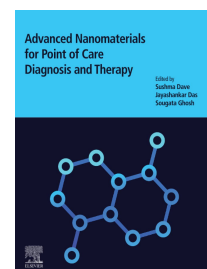
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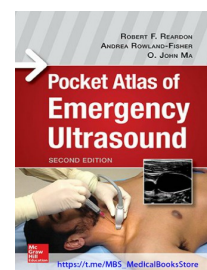
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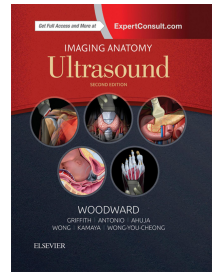
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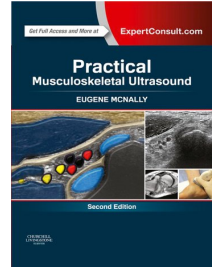
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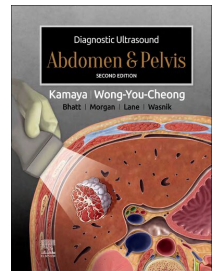
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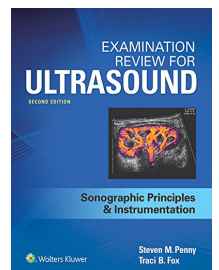
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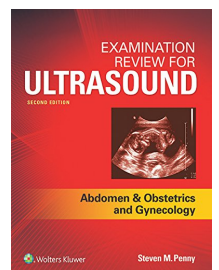
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Second Edition

# Point-of-Care **ULTRASOUND**



Nilam J. Soni  
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Pierre Kory



# Point-of-Care Ultrasound

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# Point-of-Care Ultrasound

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*This book is dedicated to all the compassionate and hardworking clinicians who stay at the bedside to provide the best possible care to their patients.*

*To my colleagues, whose passion for ultrasound invigorates me.*

*To my patients, whose journeys have taught me more than medicine.*

*To my family, whose limitless support, sacrifices, and love make it all possible.*

**NS**

*With gratitude to my family, my mentors, and my patients.*

**RA**

*To my angels, Amy, Ella, Eve, and Violet, along with my dear parents, Leslie and Odile, for their unwavering patience, support, and love.*

**PK**

Point-of-care ultrasound (POCUS) has been shown to make procedures safer, expedite and increase the accuracy of diagnoses, and raise confidence in clinical decision-making. POCUS is one of few new technologies that brings providers closer to patients, putting them right at the bedside, enriching the experience for patients and providers alike.

The first edition of *Point-of-Care Ultrasound* was published in 2014 and established a foundation for sharing knowledge across multiple specialties that utilize varied bedside ultrasound applications. Since its initial publication, the book has been translated into Chinese and Spanish, with thousands of copies distributed worldwide. As more providers have learned *what* POCUS is, they have turned to this book to learn *how* to use POCUS. Given the visual and dynamic nature of ultrasonography, this book provides a rich experience with its online video-based version. Its handbook style, concise chapters, high-yield figures, and practical teaching points are attractive to busy clinicians seeking to improve their knowledge of ultrasound.

In this second edition, we expanded the content in multiple ways. First, we added six new chapters on hemodynamics, transesophageal echocardiography, second and third trimester pregnancy, pediatrics, neonatology, and transcranial ultrasound. Second, we increased the online video content from approximately 300 to over 1000 videos demonstrating normal and pathologic ultrasound findings. Third, we added new clinical cases and review questions at the end of each chapter emphasizing the key learning points of each chapter. Finally, we kept pace with this rapidly evolving field by updating the literature, images, and figures in every chapter.

Covered in detail are the principles and broad applications of POCUS that are most generalizable to health care providers from any discipline or practice setting. We are confident that the diverse interests of health care providers interested in learning POCUS will be met through this second edition of our book.

**Nilam J. Soni**  
**Robert Arntfield**  
**Pierre Kory**

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# Fundamental Principles of Ultrasound

## Evolution of Point-of-Care Ultrasound

Nilam J. Soni ■ Robert Arntfield ■ Pierre Kory

### KEY POINTS

- Point-of-care ultrasound is defined as a goal-directed, bedside ultrasound examination performed by a health care provider to answer a specific diagnostic question or to guide the performance of an invasive procedure.
- Diagnostic ultrasound was first developed and used in medicine during the 1940s, but point-of-care ultrasound has been integrated into diverse areas of clinical practice since the early 1980s.
- Important considerations when using point-of-care ultrasound include provider training and skill level, patient characteristics, and ultrasound equipment features.

### Background

Point-of-care ultrasound has revolutionized the practice of medicine, influencing how care is provided in nearly every medical and surgical specialty. For more than a century, clinicians had been limited to primitive bedside tools, such as the reflex hammer (c. 1888) and stethoscope (c. 1816), but with bedside ultrasound, providers are equipped with a tool that allows them to actually see what they can only infer through palpation or auscultation. The technologic miniaturization of ultrasound devices has outpaced integration of these devices into clinical practice. Many specialty professional societies, patient safety organizations, and

national health care agencies have recognized the potent benefits of point-of-care ultrasound and have endorsed its routine use in clinical practice. In 2001 the American Medical Association stated, “Ultrasound has diverse applications and is used by a wide range of physicians and disciplines. Ultrasound imaging is within the scope of practice of appropriately trained physicians.”<sup>1</sup> Thus it has been well recognized for nearly 2 decades that providers from diverse specialties can be trained in the use of ultrasound relevant to their specialty. This chapter reviews the major milestones in the history of medical ultrasound, with a focus on important considerations for point-of-care ultrasound.

## History

Acoustic properties of sound were well described by ancient Greek and Roman civilizations. In the 20th century, the sinking of the *Titanic* followed by the start of World War I served as catalysts for the development of sonar, or sound navigation and ranging, which was the first real-world application of the principles of sound.<sup>2,3</sup>

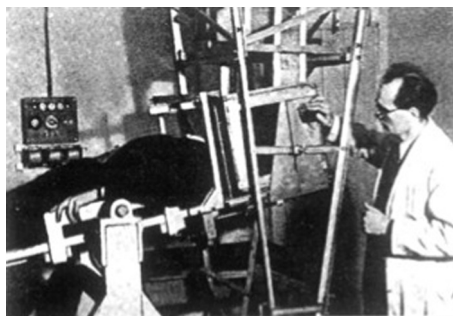
Although several physicians were simultaneously competing to be the first to use ultrasound in medicine, Karl Theodore Dussik, an Austrian psychiatrist and neurologist, is credited as being the first physician to use ultrasound in medical diagnostics when he attempted to visualize cerebral ventricles and brain tumors using a primitive ultrasound device in 1942 (Fig. 1.1).

During the 1940s and 1950s, many pioneers advanced the field of medical ultrasound. John Julian Wild described various clinical applications of ultrasound, including the difference in appearance of normal and cancerous tissues. Douglass Howry and Joseph Holmes focused on ultrasound equipment technology. They built immersion-tank ultrasound systems, including the “somascopes” in 1954 (Fig. 1.2), and they published the first two-dimensional ultrasound images. Ian Donald contributed significant amounts of research to obstetric and gynecologic ultrasonography. Inge Edler and Carl Hellmuth Hertz investigated cardiac ultrasound and established the field of echocardiography in the early 1950s. Shigeo Satomura, a Japanese physicist isolated from the pioneers in the United States and Europe, is credited as

being the first physician to use Doppler ultrasound in his studies of cardiac valve motion.<sup>3</sup>

Advancements in ultrasound technology accelerated the field in the 1960s and 1970s. Early ultrasound machines used open-shutter photography to capture screen images. Multiple still images of moving structures were captured, sequentially displayed, and interpreted by imagining the structures in motion. In 1965, Siemens released the Vidoson, the first real-time ultrasound scanner that could display 15 images per second. The Vidoson was quickly incorporated into obstetric care over the next decade and became a standard component of assessing pregnant women. Sector scanning became possible with development of phased-array transducers in the early 1970s, giving rise to echocardiography as an independent field.<sup>3</sup>

Ultrasound technology continued to advance during the 1970s and 1980s with the development of more sophisticated transducers, along with refinements in image quality. Following the early adopters of ultrasound, namely radiology, cardiology, and obstetrics/gynecology, ultrasound began to be used in emergency care, a role that marked the beginning of the era of point-of-care ultrasound.<sup>3</sup> For the first time, life-threatening conditions could be diagnosed rapidly at the bedside with



**Figure 1.1** Karl Theodore Dussik and the First Medical Ultrasound Device in 1946. (From Frenzel-Beyne B. Vom Echolot zur Farbdopplersonographie. *Der Radiologe*. 2005;45(4):363–370.)



**Figure 1.2** Immersion-Tank Ultrasound Machine From the 1950s. (From Hagen-Ansert SL. *Textbook of Diagnostic Sonography*. 7th ed. St Louis: Mosby; 2011.)

portable ultrasound. Frontline physicians, mostly surgeons and emergency medicine physicians, started assessing trauma patients with ultrasound in the 1970s, and the term FAST exam, or Focused Assessment with Sonography in Trauma, was coined in the early 1990s.<sup>4-6</sup> The FAST exam was incorporated into Advanced Trauma Life Support (ATLS) guidelines in the late 1990s.<sup>7,8</sup> From its early description in the 1970s in Europe to its incorporation into ATLS guidelines in the 1990s in the United States, the FAST exam established a precedent for defining point-of-care ultrasound applications and incorporating these applications into routine clinical practice.

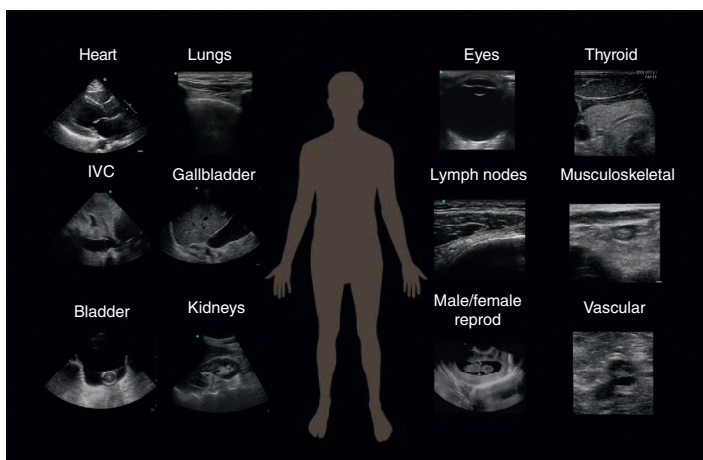
Since the 1990s, point-of-care ultrasound has been integrated into nearly every specialty's practice. In addition to defining specific point-of-care ultrasound applications in the 1990s, such as the FAST exam, general medical ultrasound applications, broadly applicable to many specialties, started to emerge. In the 1980s, ultrasound artifacts of the lung—an organ long felt to have little utility in ultrasound diagnostics—began to be described. Correlation of lung ultrasound artifacts with discrete lung pathologies was codified by Daniel Lichtenstein, a French critical care physician. His work gave rise to the field of lung ultrasonography.<sup>9</sup> Even though lung ultrasound was first used by intensivists to evaluate critically ill patients, lung ultrasound is broadly applicable to any patient with pulmonary symptoms, is more accurate than chest x-ray, and can be used by any health care provider with appropriate training.<sup>10</sup>

Another broad application that emerged was the use of ultrasound to guide invasive bedside procedures. Multiple studies since the 1990s have demonstrated reduced mechanical complications and increased procedure success rates when ultrasound is used to guide bedside procedures, in particular the insertion of central venous catheters.<sup>11,12</sup> Current guidelines from multiple professional societies and patient safety organizations recommend that all providers use ultrasound guidance when placing internal jugular central venous catheters.

Ultrasound technology was well advanced by the 2000s, when three-dimensional ultrasound emerged for select diagnostic applications; however, use of two-dimensional ultrasound has remained the standard of care for the majority of indications. The most important change during the 2000s was continued reduction in

the size and price of ultrasound machines. The increased portability and affordability of ultrasound devices led to an exponential increase in the use of ultrasound by providers from different specialties. Subsequently, many professional societies published practice guidelines on use of point-of-care ultrasound, including the American Institute of Ultrasound in Medicine (AIUM), American College of Emergency Physicians (ACEP), American College of Chest Physicians (ACCP), and American Society of Echocardiography (ASE). Furthermore, consensus guidelines between imaging and specialty societies have been established, such as the guidelines on obstetrical ultrasound collaboratively developed by the American College of Radiology (ACR), American College of Obstetricians and Gynecologists (ACOG), AIUM, and Society of Radiologists in Ultrasound (SRU). Another consensus guideline between two societies is the ACEP-ASE statement on focused cardiac ultrasound in the emergent setting.<sup>13,14</sup> Specialty-specific guidelines also emerged, such as the American Association of Clinical Endocrinologists guidelines on thyroid ultrasound that defined a pathway for endocrinologists to earn a certificate of competency in thyroid and neck ultrasound.<sup>15</sup>

Medical educators recognized the importance of teaching basics of ultrasound in the early 2000s and began to explore how to incorporate ultrasound training into curricula for medical students, residents, and fellows. The Accreditation Council for Graduate Medical Education (ACGME) began to mandate certain residencies and fellowships in the United States include basic ultrasound education; for example, pulmonary/critical care fellowships are now required to include training in general critical care ultrasound, ultrasound-guided thoracentesis, and ultrasound-guided central venous catheterization. Many medical schools worldwide have started to expose their students to the principles and practice of ultrasound, most often in conjunction with anatomy and physical examination courses.<sup>16-19</sup> The coming generation of physicians will thus be more adept at point-of-care ultrasound applications and will consider use of ultrasound to be routine in most clinical encounters. Whereas past generations' contributions established the utility of ultrasound as a valuable bedside tool in diagnostics and procedures, the next generation will advance the field by studying how point-of-care ultrasound can be best incorporated into



**Figure 1.3** Common Diagnostic Applications of Point-of-Care Ultrasound. IVC, Inferior vena cava.

patient care algorithms and its effect on health care outcomes, cost-effectiveness, and patient experience.

## Key Considerations

Point-of-care ultrasound exams differ from comprehensive ultrasound exams in several aspects. Point-of-care ultrasound is most often used to detect acute, potentially life-threatening conditions, where detection at the bedside expedites patient care. Point-of-care ultrasound exams are dedicated exams of a single or few organs to answer specific clinical questions at the bedside. In contrast, comprehensive ultrasound exams thoroughly evaluate an entire anatomical region related to an organ or organ system. The workflow of ordering, performing, interpreting, and reporting such comprehensive ultrasound exams usually takes hours, whereas acquisition and interpretation of point-of-care ultrasound exams takes minutes, providing real-time clinical information to guide decision-making.<sup>20</sup>

Key considerations to improve the efficiency and quality of point-of-care ultrasound examinations include optimization of provider training, patient factors, and ultrasound equipment features.

## CLINICAL APPLICATIONS

A point-of-care ultrasound exam is aimed at answering a specific clinical question through

a focused, goal-directed evaluation and can be used to evaluate most organ systems (Fig. 1.3). Generally the goal is to “rule in” or “rule out” a specific condition or answer a “yes/no” question. Clinical applications can be categorized as follows:

- *Procedural guidance:* Ultrasound guidance has been shown to reduce complications and improve success rates of invasive bedside procedures. Procedures commonly performed with ultrasound guidance include vascular access, thoracentesis, paracentesis, lumbar puncture, arthrocentesis, and pericardiocentesis.
- *Diagnostics:* Based on the patient’s presenting signs and symptoms, an ultrasound exam can narrow the differential diagnosis and guide treatment, or additional investigations, especially in urgent or emergent situations. Focused ultrasound exams are commonly performed to evaluate the lungs, heart, gallbladder, aorta, kidneys, bladder, gravid uterus, joints, and lower-extremity veins (Fig. 1.3).
- *Monitoring:* Serial ultrasound exams can be performed to monitor a patient’s condition or to monitor the effects of a therapeutic intervention without exposing patients to ionizing radiation or intravenous contrast. Common applications include monitoring inferior vena cava distention and collapsibility during fluid resuscitation, monitoring left ventricular contraction in response to inotrope initiation, and monitoring for

resolution or worsening of a pneumothorax or pneumonia on lung ultrasound.

- *Resuscitation:* Use of ultrasound during resuscitation for cardiac arrest is a unique but underutilized application. Bedside ultrasound can direct emergent interventions by rapidly assessing for a pneumothorax, cardiac tamponade, or massive pulmonary embolism. In addition, ultrasound can be used to assess cardiac activity to help guide prognosis in cardiac arrest. Visualization of cardiac standstill or clotting within the heart chambers allows providers to stop futile interventions, whereas visualization of subtle or weak cardiac contractions typically justifies the continuation of resuscitative efforts.
- *Screening:* Screening with ultrasound is potentially advantageous because it is noninvasive and avoids ionizing radiation. Although screening for abdominal aortic aneurysm or asymptomatic left ventricular function using point-of-care ultrasound has been described, more widespread screening applications have been slow to develop due to the challenge of weighing benefits of early detection against the harms of false-positive findings that can lead to unnecessary testing or procedures.<sup>21–23</sup>

## PROVIDER TRAINING

The amount of training required to achieve competency in point-of-care ultrasound applications varies by provider skill acquisition and ultrasound exam complexity. Prior experience with ultrasound greatly facilitates learning new applications. The training required to achieve competency in the use point-of-care ultrasound will vary based on the provider's scope of practice; for example, a rheumatologist may be proficient with musculoskeletal ultrasound but less proficient with cardiac or abdominal ultrasound, whereas the opposite may be true for a critical care physician. Protocols from published studies on ultrasound education have differed, but it is generally accepted that training must include hands-on image acquisition and interpretation practice, supplemented by focused didactics. Current studies have provided general guidance on the average number of practice exams needed to acquire the skills to perform specific types of exams; for example, novice users have been able to achieve an “acceptable” skill level in focused cardiac

ultrasound after performing 20 to 30 limited cardiac examinations.<sup>24</sup> Although a minimum number of exams will likely continue to be required for certain certifications, future generations will focus on competency-based education, with competency determined by achievement of certain milestones rather than completion of a predetermined number of exams.

## PATIENT FACTORS

Body habitus, positioning, and acute illness are important considerations when imaging patients. Similar to plain film radiography, ultrasound waves are attenuated by adipose tissue, and ultrasound has limited penetration in morbidly obese patients. Lower frequencies must be used for deeper penetration, resulting in lower-resolution images. Positioning can limit ultrasound examination; for example, acquisition of apical cardiac ultrasound images is often limited in patients who cannot be placed in a left lateral decubitus position. Similarly, providers often have to adjust their own position to evaluate pleural effusions and perform thoracentesis when patients are unable to sit upright. On the contrary, ascites and pleural effusions improve visualization of deep organs due to propagation of sound waves in fluid.

## ULTRASOUND EQUIPMENT

Early adopters of point-of-care ultrasound were often faced with using large, full-platform ultrasound machines, where lack of familiarity with the features and controls presented a barrier to use. Fortunately, a wide variety of portable ultrasound machines designed specifically for point-of-care use with ease-of-use as a priority are now available. These machines range from pocket-sized devices to laptop-style machines. Most recently, a surge of handheld and pocket-sized devices has entered the marketplace and are being purchased by individuals as personal devices. Thus, availability of ultrasound machines, the most commonly reported barrier to use of point-of-care ultrasound, is a problem that may soon be solved.<sup>25,26</sup>

The diminution in size of portable ultrasound machines comes with certain limitations: small screen size, limited transducer selection, few imaging modes, and few adjustable parameters to optimize the image. However, new

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# Exploring the Variety of Random Documents with Different Content

VOLUME IV, No. 3.

MARCH, 1914

# **THE DELINQUENT**

**(FORMERLY THE REVIEW)**

VOLUME IV, No. 3.

MARCH, 1914

# **THE DELINQUENT**

**(FORMERLY THE REVIEW)**

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# THE “DOPE HABIT”

[We reprint Edward Marshall’s illuminating article from the New York Times of February 22nd on the most recent serious menace within our prisons, and outside of them. There has come throughout the country, apparently a relatively sudden realization of the fearful effects of the habit-forming drugs.]

Habit-forming drugs and their ravages, destructive of both the morals and the health of the community, seem at last to have aroused commensurate human indignation, at least in New York city.

Discussion is continual of this strangest and saddest of the problems of our modern civilization; city officials are definitely interested, studying and planning; a committee, including in its membership magistrates and others of sociological force, works on an impulse supplied by Mrs. Vanderbilt; and from a third source definite legislation emanates to be offered in the Legislatures of this and other States and in the National Congress.

Nothing more astonishing, nothing more appalling than the hold which habit-forming drugs have taken on the community at large can be found among the tragedies peculiar to modern civilization.

And all this has come suddenly. Not so many years ago the opium smoker was the only known victim, and he was a curiosity of Chinatown; the morphine taker was a rare, and troubled spirit, stalking solitary in its slavery and misery; the cocaine fiend remained unknown, and the heroin addict—latest in all this incomparably tragic company—was undreamed of.

Now opium smoking, though still the cause of an occasional police raid, has sunk into insignificance by comparison with morphine taking; cocaine habitues are not uncommon sights upon the streets to those with the depressing knowledge which identifies them; police slang has coined a name for them—"snowbirds"; and we read in almost every issue of our daily newspapers of new developments of the "heroin habit."

Habit-forming drugs of one kind or another have gained so strong a hold upon the people of this country, more especially upon the people of American cities, that they have reached the dread proportions of a national curse.

They play their tragic part in uncounted domestic tragedies; an annual crop of business and professional failures numerically approaching the sad army of alcoholic wrecks is thrust into the various bins wherein we hide our human refuse; drugs send their yearly thousands of young men into the prisons, of young women to the streets.

A native Southerner, of national fame, high in the councils of his party, told me recently that habit-forming drugs, cocaine principally, have of late so complicated the negro problem of the South as to triple its difficulties and dangers.

These heroin and cocaine groups, lately so conspicuous, are insignificant in numbers and in tragedy when compared by those who know with the thousands to be found among our citizenship who, driven only into misery, not into viciousness or crime, by drug addictions, fall innocent victims to this most terrible of modern curses, sad sacrifices to illness and to pain, to ignorance and to cupidity.

The victims of drug habits who have been led into them through the mistaken methods of the doctor, who first administers the drug to ease acute physical suffering, and by the proprietary medicine or

drug store preparation passed out as cure-alls with an indifference to or ignorance of consequences which must remain incredible to those who understand, is infinitely more numerous than the growing group of drug takers led into their addictions by the tendency towards dissipation.

Drugs are even taking hold upon our youth. Within the year many instances have been cited in the newspapers, which have uncovered peddlers of cocaine and heroin to school children. I listened recently to the appalling story of a seventeen-year-old Connecticut boy, brought by his father for treatment in this city, who told how he had been the center of a group of not less than a hundred other boys in his own town who gained the drug through him and were completely at his mercy.

I was present recently when this father told the story, having brought the boy to the metropolis for treatment. It was practically the duplicate of many, and illustrates the real necessity of legislation, which will impose upon the druggist and the medical profession a general restriction.

"My boy," this sorrow-racked and disappointed father said, "was employed by a physician living near us to care for his automobile. He paid him for his work by giving him prescriptions for heroin. My boy quickly became a victim of the habit, and soon formed the centre of a group of twenty or more other boy victims, who secured from him the prescriptions by means of which they brought the drug.

"Two large manufacturing establishments in our home town were thus infected, and at the present time not less than one hundred boys have become slaves to the habit. They buy the drug in quantities as large as they can pay for from the largest drug store in our city, and are never questioned."

Their home city is Bridgeport, Conn. I have in my possession one of the prescriptions given to the boy by the physician, who thus paid him for his services in attending to his motor car.

In New York State and city the situation is not better. The police records have been full of "dope cases" for years. Morphine and heroin are doing serious work in the demoralization of the city, and the ravages of cocaine are as serious here as they can be among the negroes of the South.

Miss Katharine B. Davis, now in the full swing of her duties as Commissioner of Correction, tells me that she finds her problems complicated all along the line by drug addictions among inmates of the city's prisons and jails, and the Mayor and other members of the city government are looking into the whole subject with deep interest.

In her efforts to discover how the city's prisoners get drugs, Miss Davis has uncovered strange, almost uncanny methods. A prisoner's wife or "girl" brings him clean handkerchiefs or shirts, stiffly starched. Left alone with them, he chews them eagerly, getting thus the morphine which impregnates the starch.

Another prisoner greedily sucks an orange which has been brought to him. Investigation shows that through a tiny puncture its juice has been withdrawn, to be replaced through a hypodermic syringe, after it has been transformed into a saturate solution of morphine.

Fountain-pens are now taboo among the prisoners. Their barrels may be filled with drug tablets.

In a letter now in my possession, written to Charles B. Towns, the drug expert, by Dr. Charles W. Farr, prison physician of Sing Sing, the doctor, after announcing the successful treatment of some drug addicts, continues:

"But the men seem to be able to get the various drugs as readily as ever. I suppose that the usual method is to have the guards bring it in for them. When questioned the prisoners always blame the traffic on the honest and unpopular guards who are not really concerned with it. I asked a convict to estimate the number of drug takers among the prisoners. He answered:

"Counting the habitual users and the "joy riders," there are probably two hundred in this prison."

And while these demoralizing novelties are frequently discovered in the underworld, the hold which habit-forming drugs are getting elsewhere, with the worth while, is admittedly appalling. There are pharmacists in New York city whose important trade is drug traffic; there are physicians here, and not a few, who, while drug addicts themselves, find their practice also among drug addicts, furnishing prescriptions daily to habitues, collecting fees proportioned to their victims' purses.

As these things have become generally known, so has work begun to check the evils. Within a few days the most comprehensive legislative plan which has so far been proposed for regulation of the traffic in all habit-forming drugs has been launched at Albany.

It will presently be launched in the New Jersey and all other State Legislatures. It is further planned to make this definitely comprehensive and effective by Federal legislation, already drafted and soon to be introduced at Washington.

Charles B. Towns, its author, also wrote the law, already on the statute books of New York and several other States, permitting the sale of the hypodermic syringe only upon prescription by a doctor; he presented last year at Albany a comprehensive bill which did not pass.

His measure of this year, known in the Senate as the Boylan bill, includes many features new to legislation of the sort, and has already won outspoken approval from many members of the medical profession, including Dr. Alexander Lambert of New York, and Dr. Richard C. Cabot of Boston. Commissioner Davis has gone over it with care, indorsing it.

"To wholly control the drug evil, which is so unfortunately affecting New York City and the State, by any legislation entirely local to the State," said Mr. Towns, "is out of the question. But a beginning must be made at home.

"For various reasons habit-forming drugs have found a stronger foothold in this country than elsewhere in the world. Our annual opium consumption, per capita, is far greater than that of China, although we use it principally in the form of its derivatives, morphine, etc., and our consumption of cocaine has grown to a magnitude unprecedented anywhere.

"Most of the legislation drafted for the purpose of restricting the use of habit-forming drugs has been ineffective. It is ridiculously easy to-day to obtain morphine or any other of the inhibited substances in New York without violation of the law, although New York has laws which were designed to be of drastic force.

"The classification in my bill reads: 'Opium, morphia, coca leaves, cocaine, alpha and beta cocaine, their salts, derivatives and preparations.'

"This classification includes automatically many substances which it does not specifically mention, but which have recently attracted much attention because of their common use among drug-habitues.

"Among these is heroin. But heroin is a derivative of morphine, which is the active principle of opium, and is three times as strong as the parent drug.

"It is not mentioned in the bill because the word 'heroin' is a mere trade name, and a law prohibiting its sale under that name would not prohibit the sale of the same substance under any one of the new trade names which manufacturers would have no difficulty in coining.

"I speak of this almost at once, because I have had several inquiries as to why this drug apparently is omitted from the list named in the bill.

"To intelligently discuss the reason for the prevalence of drug addictions in this country would necessitate an exhaustive study of national psychology.

"Patent medicines containing small quantities of habit-forming drugs have wrought great havoc with us, for any medicine, containing any quantity of any habit-forming drug, contains it in habit-forming quantity if the dosage is regular. It is not the quantity, but the regularity of dosage which produces drug habits.

"A lack of understanding of this fact upon the part of the medical profession and the public has been responsible for many drug addictions.

"The cocaine habit had its start in patent medicine, mostly so-called catarrh cures, and will find its end in a national degeneration if it is not checked by drastic legislation.

"Heroin was first advertised about fifteen years ago, and accepted by the medical world as a non-habit-forming substance, having all the useful qualities of the dangerous habit-forming drugs.

"Having been thus started, and innocently promoted by physicians and druggists, the progress of the habit, which has become a sanitary, criminal, and social problem of real moment,

can be halted only by the passage of some law including such provisions as those I have included in the bill now pending in Albany.

"My plan is not accidental. I went to the Orient in 1908-1909 and spent a year there, studying the opium curse as it has there developed. Returning to this country I have since been thrown into the closest contact with the various drug addictions, passing several hundred cases in minute review each year. Last Summer I toured Europe and found that drugs have gained comparatively slight foothold there, and that no European nation has produced restrictive legislation worthy of consideration.

"Our own internal revenue reports show us to be consuming as many of these drugs as all of Europe put together uses.

"Of course, the fact that the drug traffic has continually increased in this and every other State despite the presence on the statute books of laws thought to be stringent, can mean but one thing—that in these laws are loopholes.

"The same laws which require that these drugs must be dispensed only upon presentation to the druggist of a physician's prescription fail to forbid a layman from posing as a physician in making out prescriptions; no obligation of investigation is imposed upon the druggist.

"The drug trade is practically without legal regulation, although across the drug store counter are dispensed substances at least as dangerous to individuals and public welfare as those which are dispensed across saloon bars—and saloons are regulated very rigidly.

"No registration of manufacturing, wholesale or retail druggists is required by law. The importation, manufacture and distribution of habit-forming drugs are now surrounded by fewer

restrictions than are thrown about tobacco. The proposed law provides for records of each grain, from the time it leaves the manufacturer until it reaches the ultimate consumer.

"Any druggist, wholesale or retail, may manufacture and market any proprietary medicine he may desire, containing certain quantities of these drugs, and offer it openly for sale, without the formality of a physician's prescription.

"The clause in the otherwise worthy and admirable National Pure Food and Drugs act requiring that any drug store composition containing any quantity whatsoever of any habit-forming drug must bear upon its label an announcement of this content, was well meant, but has worked havoc.

"Even as no physician who administers a habit-forming drug to ease his patient's pain should acquaint that patient with the nature of the drug he gives, lest the patient turn again to it when pain recurs and fasten something worse than pain upon himself, despite the doctor's wishes, so no medicine offered for general sale and bearing on its label the announcement of its content of a pain-killing, habit-forming drug should by the law be tolerated.

"Relieved by the medicine those who take it read its label carefully, learn what has afforded the relief—it always is a mere relief, it never is a cure—and, unacquainted with the dangers attending substances of the sort, regularly dose themselves, either with increased quantities of the medicine or more probably with the straight drug.

"A drug-tainted patent medicine is absolutely certain to establish a drug habit in any one who, for any length of time, takes it according to directions.

"The proposed law makes such patent medicines, containing any quantity whatever of the habit-forming drugs, illegal.

Physicians rarely if ever give prescriptions for them. The public will lose nothing and gain much through their abolishment.

"Now let us consider the physician.

"Physicians are at present permitted to prescribe and administer the habit-forming drugs as loosely and extravagantly as they please, either to themselves or others, without responsibility as to the outcome. Under the proposed law they are held responsible.

"There is real necessity for the provision which disbars from medical practice physicians who take drugs. The drug-taking doctor is more dangerous than the drug-taking druggist or drug clerk. All are liable to irresponsibility at a time when it may well mean death to others; and, furthermore, all are promoters of the drug habit. The proposed law guards against them.

"The drug taker invariably introduces others to his drug, sometimes openly, oftener secretly, through perverted sympathy for another's suffering.

"And if the drug-taking doctor should be barred from practice, so, also, should the drug-taking nurse and the drug-taking veterinarian.

"Now how are these things to be accomplished? The State Commissioner of Health is to prepare and furnish to all local Health Boards or officers official prescription blanks, serially numbered and bearing the State seal, making their imitation forgery.

"These are to be furnished to physicians on demand, and no drugs of this class are to be dispensed, save on their presentation properly filled out and signed; no prescription shall be refilled; all filled prescriptions shall be filed and open to periodical health board inspection, bearing not only dates and

names of the physicians, but the names of patients for whom the drug is ordered, and no such prescription shall be filled more than ten days after issuance.

"To the purchaser, for his protection, while he has the drug in his possession, druggists must issue a certificate, giving their names and addresses and those of the prescribing physician.

"These are the principal restrictions surrounding the prescription blank, though there are others. And violations of these regulations are to be regarded as misdemeanors.

"In this proposed law, also, is incorporated a provision similar to that of the existing law restricting the sale of hypodermic syringes to physicians' prescriptions.

"This roughly indicates the proposed provisions covering the sale of habit-forming drugs. They are followed by one which may seem almost fantastic to the person unacquainted with the terrible psychology of drug addictions.

"I shall preface any explanation of it with the announcement that the drug habit is not a mental state, but a physical condition. My knowledge of it, gained from observation of many hundreds of its victims, will forever prevent me from proposing or pushing any further restrictions of the traffic, until some provision is made for the relief of those already enslaved.

"To deprive a drug addict of his drug without giving him definite medical help must inevitably subject him to such suffering, such incredible and indescribable torment, as cannot otherwise be brought upon mankind. It may mean death; it is very likely to mean insanity. The drug addict will steal to get his drug; indeed, he may do murder in order to obtain it.

"Therefore this bill provides for the treatment and relief of those who, rendered unable to procure their drug by the provisions of

the legislation, might otherwise be made the victims of a social progression.

"Such a relief is possible and not too difficult. The treatment by means of which it may be accomplished bears my name, but is no monopoly. I could gain no profit from its use by the authorities and others. It includes no medicaments not purchasable at any well-stocked pharmacy. I have freely published broadcast every formula connected with it, unrestricted, for the benefit of the medical profession. It is now in use by the authorities in Sing Sing Prison, at Bellevue Hospital, in the hospital on Blackwell's Island, and elsewhere. Plans are under way for its more extensive use by the authorities.

"Very briefly I have sketched the provisions of this proposed State legislation. It should be welcomed by the doctor, for it puts him absolutely in control of one of his most valuable assets, the pain-deadening drug, a control which he must share, as things at present stand, with every corner druggist and every manufacturer of patent medicines.

"Decent druggists will welcome the planned regulations. It will protect them against thefts of drugs by employees, and the drug-taking drug clerk is a dangerous and at present all too common handicap on the employing druggist.

"A certain reputable retail druggist of my acquaintance tells me that within a year he has discharged two clerks, one for taking morphine, one for using cocaine. They were a threat against his welfare. How much greater was their threat against the public welfare?

"Neither the drug-taking doctor nor the drug-taking drug clerk will be a possibility under the provisions of the proposed new legislation, which demands that every grain of any of these

drugs dispensed by or in the possession of druggist or a doctor, shall be instantly accounted for upon demand of the Health Board.

"The present situation, so terrifying that it forms a problem of our modern civilization, has grown out of the fact that neither the physician nor the druggist have been held really responsible.

"The druggist has been permitted to import and manufacture as freely as he pleased, and to sell under restrictions which were insufficient to prevent promotion of drug habits; the physician has never been required to make accounting for prescription of or the administration of these dangerous substances, and his medical training, both in college and in hospital, has left him in the dark concerning the danger point in their administration.

"This proposed New York State legislation has been drawn with careful eye to the establishment, here in the Empire State, of a model law for other States. General adoption of such legislation would make proper Federal laws effective and without a perfect understanding between the State and Federal Government as to where responsibility of each begins and ends, no really effective action will be possible to either.

"The first step for the Federal Government will be to require the registration of all importers and manufacturers of habit-forming drugs, all wholesale druggists and drug jobbers, and all retail druggists. A similar registration is now required of all those engaged in the tobacco trade.

"The regulation of interstate traffic in such drugs will be a simple matter. A system of uniform order blanks furnished to the buyer, and of uniform invoice blanks furnished to the seller on demand, by the Government, can be so arranged that every step of every interstate shipment can be closely followed.

"It will be necessary to require that habit-forming drugs shall be shipped in bond; that the importer shall account for all which he imports, the manufacturer for all which he manufactures.

"The passage of the law subjecting importations of opium prepared for smoking to a prohibitive tax lost us millions in annual revenue and increased the vice of smoking opium, for it forced the preparation of raw opium for smoking in this country—an art which theretofore had been in the exclusive possession of an ancient Chinese company. Under this law opium prepared for smoking is cheaper in this country than it was before its passage. Let us have no more abortive legislation on this vital subject.

"Ninety-five per cent. of the whole nation's drug evil could surely be avoided by the general adoption in all the States of legislation such as this proposed in New York State, supplemented by such Federal legislation as I have outlined."

# **A COURSE FOR PRUSSIAN PRISON OFFICIALS AND OTHERS**

**BY AUGUST PLASCHKE, MINISTRY OF JUSTICE, PRUSSIA**

I am very glad to give to The Delinquent information regarding the course of instruction in penology which for the last ten years has been conducted by the Prussian Ministry of Justice. There are three kinds of prisons under the supervision of the Ministry of Justice:—

1. The local prisons, under the direction of the local magistrate.
2. The county prisons, under the direction of the ranking county district attorney.
3. The large, so-called "special prisons," of which the "Director" is the executive officer.

We had the experience that the directors of those prisons I have named under 1. above did not always meet the demands that we believed the government had the right to require of them, because they did not possess the necessary means and knowledge. The training of the lower officials in these local institutions was also often faulty. To be sure, there prevailed in general a condition of cleanliness, order and honesty, but the treatment of the prisoner according to the crime and to the individuality of the inmate was often pretty poor.

On the other hand, we came to the conclusion that only those judges could properly and reasonably impose a just sentence who knew and had studied the effect of imprisonment and the administration of a prison sentence upon the prisoner. And so there

developed from this idea the requirement that the judge should also be assigned to the office of prison warden. And so, with the introduction of the course on prison administration, we had two aims:—

1. The understanding of the judge should be strengthened as to the effect of imprisonment upon the prisoner, in order that proper sentences should be imposed, not only from the standpoint of the law, but from that of the individual to be imprisoned.
2. It was important to develop prison wardens who would understand the effects of imprisonment and who could therefore administer their office properly. This required a proper training in all the details of prison administration, and the rules and regulations. We were confident that when the warden became conversant with all these matters, if he then had the necessary knowledge and interest, he would also train up in his turn the lesser officials of the prison.

So much for the purposes of the course in prison administration. We carry on the course in the following manner. We issue, around January, not a special, but a general invitation to attend the course. The invitation goes to recently admitted members of the bar, judges, district attorneys, and also to clergymen, physicians and the higher prison officials, who have shown special interest in their work. The invitations are very numerous. But since we can receive at the most only from 24 to 27 persons, in order to do each person justice during the two weeks of the course, only about fifty per cent. of the requests for admission can be considered.

The course is divided into two parts, practical and a scientific. During the forenoon the men in the course work in the prisons, where they are instructed in all the details of the administration. In the afternoon, scientific lectures are held, with following discussion, lasting often four hours or longer. I regard this part of the course as

of great value. After the close of the course, during which, by the way, there are inspections of a number of institutions, the participants in the course return to their occupations, with the admonition that they shall pass along the knowledge they have acquired, and especially to give to the lesser officials of the respective prisons from which they have come, the benefit of what they have acquired. In this manner we send out through the Kingdom of Prussia every year a corps of new teachers.

Moreover, we ascertain who among the men that have taken the course has shown special interest, and is inclined to become the warden of a prison, and we send him for several months to one of our best conducted institutions, "in training." Here he takes up the ordinary duties of the minor officials, up to and including the duties of the director of the institution himself. And if he shows himself well qualified, he is assigned as soon as possible to the position of representative of the warden, or his associate in the case of especially difficult tasks, and in this manner comes to learn the duties of prison warden in a number of institutions. And from this group of men the directors of the prisons are chosen.

As to the subjects of the lectures of the course, I would say that I cannot be very specific, for they change from year to year. The lecturers are both executive and theoretical. Among the teachers I might mention Professors Kahl, von Hippel, and Moehli. Among the subjects are the following:

Prison System and Prison Architecture.

The Mentally Deficient: their responsibility and methods of treatment.

The Treatment of Juveniles.

Organization of the Prison Administration.

If you wish, I shall be very glad to send you the program of the last course.

I can say, with much satisfaction, that we have really succeeded with these courses, and that they have found very favorable mention both in the press and in Parliament. The participants in the course complain sometimes because they are driven so hard, and I confess that the mental strain is considerable. But they nevertheless show great zeal and industry.

# **IMPORTANCE OF AN UP-TO-DATE MEDICAL DEPARTMENT IN A PENAL INSTITUTION.**

**By JOHN L. WHITMAN, SUPERINTENDENT CHICAGO HOUSE OF CORRECTION**

[Read at the American Prison Association, October, 1913]

It would seem as though the management of penal institutions, and especially houses of correction, could do no greater service to society than to give to their inmates the medical treatment and training they so badly need, and send them back to society at least somewhat prepared to take their places among men with a more equal chance of success.

As a result of observation made at the Chicago House of Correction, along these lines, the medical department of this institution has been equipped and enlarged during the last five years, so as to carry on some of the kind of work indicated.

The demonstrations made are most encouraging, not only to continue, but to still further increase the capacity. At present, instead of having only one physician, as in former years, who was expected to look after the needs of the entire population in all the different branches of medical science, which is impossible for one man to do, no matter how efficient and interested he might be, we have in addition to Dr. Scelesh, the Medical Superintendent, whose entire time and attention is given to the department, four internes, who are physicians, and two professional and registered nurses, who also

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